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COSMIC

MARCH
MONTHLY REPORT

Computer Software Management and Information Center
112 Barrow Hall — University of Georgia — Athens, Georgia 30602

1. GENERAL INFORMATION

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The preparation for the Eleventh NASTRAN User's Colloquium is on schedule. The agenda and workshop schedule were finalized. The Introductory sessions are full and the Intermediate sessions are nearly full. Twenty papers are scheduled for presentation at the colloquium.

The generation of the CDC version of NASTRAN Release 4/83 was begun during March. This release of NASTRAN is scheduled for completion during April, with shipment to all current lessees during the month of May.

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UNIVERSITY OF GEORGIA

COMPUTER SOFTWARE MANAGEMENT

AND

INFORMATION CENTER

MONTHLY PROGRESS REPORT

March, 1983

UNDER CONTRACT

NASW-3247

April 15, 1983

PREPARED FOR

TECHNOLOGY UTILIZATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WASHINGTON, D. C.

TABLE OF CONTENTS

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2. INVENTORY

The current inventory of programs available from COSMIC is the sum of the Class 1 and Class 2 programs in TABLE 1. "Issuability Status Summary." The total number of items submitted from each source since COSMIC began is given in the right hand column of TABLE 1. Numbers listed under the "Withdrawn" column reflect those packages for which return or discard authorization has been provided by the appropriate Technology Utilization Office.

TABLE 1. ISSUABILITY STATUS SUMMARY
July 1966 to Date

Center Mnemonic	Class 1	Class 2	Class 3	Class 4	In Process	With-drawn	Total
ARC	33	10	9	3	0	28	83
COS	0	17	0	1	0	65	83
DOD	0	47	12	0	0	23	82
ERC	0	0	0	0	0	13	13
ERL	5	7	0	0	1	1	14
FRC	5	6	0	0	0	4	15
GSC	80	41	5	4	3	219	352
HQN	15	10	0	0	0	72	97
KSC	5	22	1	1	0	80	109
LAR	168	60	3	5	2	78	316
LEW	137	77	1	1	3	86	305
MFS	96	109	28	6	1	1097	1337
MSC	86	140	9	0	2	787	1024
NPO	82	50	6	1	3	248	390
NUC	9	6	0	0	0	60	75
WLP	0	0	0	0	0	11	11
WSO	0	0	0	0	0	3	3
Totals	721	602	74	22	15	2875	4309

The number of submittals for the current month is average. COSMIC received five initial packages (program and documentation), and one initial program (no document included with submittal). Also, COSMIC received one update program, one additional document, and four additional programs. The total number of receipts for this month is twelve. A summary of the total number of receipts by submittal site is shown in TABLE 2.

TABLE 2. SUMMARY OF TOTAL RECEIPTS 1983

Submittal Site	This Month	Year to Date
ARC	0	0
COS	0	0
DOD	0	0
ERL	1	1
GSC	3	7
HQN	0	6
KSC	0	0
LAR	2	6
LEW	4	12
MFS	0	1
MSC	0	5
NPO	2	5
Total	12	43

3. EVALUATION AND PUBLICATION

The program processing activities can be viewed as a three step process, although the steps are not necessarily done in sequence. These steps are program verification, program evaluation, and abstract preparation and publication.

Program verification represents the machine processing phase of evaluation and typically includes the compilation or assembly of supplied code using standard programming language translators followed by loading or linkage editing of the generated object code to insure completeness of the submitted code. This month COSMIC processed twelve programs through verification.

Program Evaluation involves the review of programs and supporting documentation following the machine processing phase to determine their suitability for public release relative to the standards of completeness and content specified in the COSMIC Submittal Guidelines. Prices for distributed materials are also established during package evaluation. Factors considered in establishing the price charged for program code include the program source instruction counts as a gross measure of development effort, the machine independence or vintage, the quality of the supporting documentation, the known or assumed sales potential for the package, the functionality of the program relative to comparably classified packages, and the demonstrated level of developer programming support.

The program evaluation activity for the current month totaled 30 packages; ten Class 1, zero Class 2, twenty Class 3, and zero Class 4.

A cumulative tabulation of COSMIC evaluations since January 1, 1983, is given in TABLE 3.

TABLE 3. SUMMARY EVALUATION TOTALS

January 1983 to Date

Submittal Site	Class 1	Class 2	Class 3	Class 4
ARC	0	0	3	0
COS	0	0	0	0
DOD	0	0	3	0
ERC	0	0	0	0
ERL	0	0	0	0
GSC	3	0	3	2
HQN	6	0	0	0
KSC	0	0	0	1
LAR	4	0	0	0
LEW	7	0	0	3
MFS	1	0	4	1
MSC	2	1	3	0
NPO	4	0	4	0
NUC	0	0	0	0
WLP	0	0	0	0
Totals	27	1	20	7

Publication activities carried out by COSMIC include the preparation of descriptive abstracts for all new submittal and updated Class 1 and 2 items evaluated each month as well as the preparation of Tech Briefs for the Class 1 packages for publication in the NASA Tech Brief Journal.

Publication category codes and index terms are assigned to abstracts prepared by the activity. This month COSMIC prepared 8 abstracts and 8 Tech Briefs. A list of the titles for which Tech Briefs were prepared is given below:

TECH BRIEF ITEMS

GSC-12858 - SOLVE II - Program to Solve Large Systems of Normal Equations

GSC-12862 - IDSP - Interactive Digital Signal Processor

LEW-13655 - Structural Analysis of Cylindrical Thrust Chambers

LEW-13894 - STARPIC - Computer Code for Swirling Turbulent Axisymmetric Recirculating Flows in Practical Isothermal Combustor Geometries

LEW-13930 - COM3D - Computation of Three Dimensional Combustor Performance

MSC-20448 - TRASYS II - Thermal Radiation Analysis System (UNIVAC Version)

MSC-20590 - TRAP - Transient Response Analysis Program

NPO-16234 - CRISP80 - Software Design Analyzer System

COSMIC
PROGRAM ABSTRACT

GSC-12858

SOLVE II – Program to Solve Large Systems of Normal Equations
(Business and Technological Systems Inc.)

The SOLVE II program is designed for combining any number of sets of normal equations and obtaining the solution and related statistics. The normal equations are of a matrix form such that the coefficient matrix is a square normal matrix that is non-negative definite. When a vector containing observation residual information is available, the SOLVE II program solves for the corresponding vector matrix of differential corrections. SOLVE II was developed for working with normal equations involving such geodetic parameters as gravity coefficients, surface densities, gravity anomalies, tracking station coordinates, Earth tide parameters, polar motion parameters, and satellite orbital parameters. SOLVE II has been used to work with the normal equations generated by such geodetic analysis programs as GEODYN (COSMIC Program GSC-12014).

This program is written in FORTRAN IV and ASSEMBLER for batch execution and has been implemented on an IBM 370 series computer with a central memory requirement of approximately 350K of 8 bit bytes. The SOLVE II program was developed in 1982.

LANGUAGE: FORTRAN IV (90%); ASSEMBLER (10%)

MACHINE REQUIREMENTS: IBM 370 Series

PROGRAM SIZE: Approximately 11,320 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI EBCDIC Card Image Format Magnetic Tape

PROGRAM NUMBER: GSC-12858

DOCUMENTATION PRICE: $26.54   PROGRAM PRICE: $1,260.00

COMPUTER SOFTWARE MANAGEMENT AND INFORMATION CENTER

COSMIC
PROGRAM ABSTRACT

GSC-12862

IDSP – Interactive Digital Signal Processor
(NASA Goddard Space Flight Center)

The Interactive Digital Signal Processor, IDSP, consists of a set of time series analysis "operators" based on the various algorithms commonly used for digital signal analysis work. The processing of digital time series to extract information is usually achieved by the application of a number of fairly standard operations. Also, it is often desirable to "experiment" with various operations and combinations of operations to explore their effect on the results. IDSP is designed to provide an interactive and easy to use system for this type of digital time series analysis. The IDSP operators can be applied in any sensible order, even recursively, and can be applied to single time series or to simultaneous time series. IDSP is being used extensively to process data obtained from scientific instruments onboard spacecraft. IDSP is also an excellent teaching tool for demonstrating the application of time series operators to artificially-generated signals.

IDSP currently includes twenty-eight standard operators. Processing operators provide for Fourier transform operations, design and application of digital filters, and eigenvalue analysis. Additional support operators provide for data editing, display information, graphical output, and batch operation. User developed operators can be easily interfaced with the system to provide for expansion and experimentation. Each operator application generates one or more output file from an input file. The processing of a file can involve many operators in a nontrivial application. IDSP maintains history information as an itegral part of each file so that the user can display the operator history of the file at any time during an interactive analysis.

IDSP is written in VAX FORTRAN 77 for interactive or batch execution and has been implemented on a DEC VAX-11/780 operating under VMS. The IDSP system generates graphics output for an HP2648A graphics terminal but should be adaptable to other graphics systems. The IDSP system was developed in 1982.

GSC-12862

LANGUAGE: FORTRAN 77

MACHINE REQUIREMENTS: DEC VAX-11/780

PROGRAM SIZE: Approximately 8,220 Source Statements

DISTRIBUTION MEDIA: 9 Track 1600 BPI DEC VAX Files-11 Format
                        Magnetic Tape

PROGRAM NUMBER: GSC-12862

DOCUMENTATION PRICE: $25.50   PROGRAM PRICE: $1,200.00

4/7/83

COSMIC
PROGRAM ABSTRACT

LEW-13655

Structural Analysis of Cylindrical Thrust Chambers
(Lockheed Missiles & Space Co., Inc.)

Life predictions of regeneratively cooled rocket thrust chambers have normally been derived from classical material fatigue principles. However, observed failures do not appear to be entirely due to material fatigue. Chamber coolant walls in the failed areas exhibit progressive bulging and thinning during cyclic firing until wall stress exceeds the material rupture stress and failure occurs. This computer program was developed to analyze the cumulative plastic deformation of regeneratively cooled rocket thrust chambers. This program is designed to be used in conjunction with the finite element computer program BOPACE (COSMIC Program MFS-23814). This program should be applicable to similar structures such as the hot sections of pumps and compressors.

This thrust chamber analysis program predicts the geometric and material nonlinear behavior of cyclically loaded structures without performing a cycle-by-cycle analysis over the life of the structure. It can efficiently estimate finite deformation and low cycle fatigue damage in hot structures subject to cyclic loadings. First, a finite element model is prepared and BOPACE is executed for a desired number of cycles. The thrust chamber analysis program uses nodal displacement data from BOPACE to determine nodal displacement rates and predict configuration changes over a user specified number of loading cycles. The predicted configuration can then be analyzed by BOPACE and the procedure repeated. Nodal displacement rates are computed at each node in the model by utilizing a linear least squares approximation. Once the displacement per cycle has been computed, the displacement for the specified number of cycles is computed. This nodal extrapolation method provides the user with a predictor-corrector technique wherein predicted displacements can be analyzed by BOPACE to determine if the displacement rates used in the prediction were acceptable.

Two support programs are supplied with the main extrapolation program. A plotting program provides for the plotting of undeformed structures so that the model can be visually verified. A BOPACE restart tape reader program provides for the extraction of nodal displacement data directly from the BOPACE restart tape.

This program for the analysis of cyclically loaded structures is written in FORTRAN IV for batch execution and has been implemented on a UNIVAC 1100 series computer with a central memory requirement of approximately 40K of 36 bit words. This program was developed in 1981.

LANGUAGE: FORTRAN IV

MACHINE REQUIREMENTS: UNIVAC 1100 Series

PROGRAM SIZE: Approximately 12,100 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI EBCDIC Card Image Format
                       Magnetic Tape

PROGRAM NUMBER: LEW-13655

DOCUMENTATION PRICE: $37.50   PROGRAM PRICE: $1,605.00

COSMIC
PROGRAM ABSTRACT

LEW-13894

STARPIC - Swirling Turbulent Axisymmetric Recirculating Flows in
Practical Isothermal Combustor Geometries
(Oklahoma State University)

Designers have relied almost exclusively on experimental
means for combustion chamber development. STARPIC (Swirling
Turbulent Axisymmetric Recirculating flows in Practical Isothermal
Combustor geometries) provides the designer with the ability to
make prior predictions of the flowfield. Flowfield predictions
can greatly facilitate the economical design and operation of
combustor design experiments. The STARPIC program combines
concepts from the rapidly developing fields of theoretical
combustion-aerodynamics and computational fluid dynamics. The
use of a mathematical model, like STARPIC, allows some design
results to be obtained quicker, cheaper, and more accurately
than by the exclusive use of experimental means.

STARPIC was developed to predict swirling recirculating
inert turbulent flows in axisymmetric combustion chambers. The
technique involves a staggered grid system for axial and radial
velocities, with a line relaxation procedure used for efficient
solution of the governing equations. STARPIC includes the two-
equation energy-dissipation turbulence model. Expansion flow is
modeled using a stairstep boundary representation and realistic
accommodation is made for swirl effects.

This program is written in FORTRAN IV for batch execution
and has been implemented on an IBM 370 series computer with a
central memory requirement of approximately 200K of 8 bit bytes.
STARPIC was developed in 1982.

LANGUAGE: FORTRAN IV

MACHINE REQUIREMENTS: IBM 370 Series

PROGRAM SIZE: Approximately 2,000 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI EBCDIC Card Image Format
Magnetic Tape

PROGRAM NUMBER: LEW-13894

DOCUMENTATION PRICE: $21.00   PROGRAM PRICE: $580.00

COSMIC
PROGRAM ABSTRACT

LEW-13930

COM3D - Computation of Three Dimensional Combustor Performance
(Garrett Turbine Engine Company)

A computer program, COM3D, has been developed for analyzing three-dimensional combustor performance. The advanced numerical procedures and kinetic theory employed in COM3D give the combustion engineer the ability to predict internal combustor flow field characteristics. As an analytical design tool, COM3D offers the potential of reducing the design and development time required for gas turbine combustors. It could also add to the engineer's understanding of the phenomena affecting combustor performance and provide the basis for designing better combustors.

COM3D is capable of predicting recirculating turbulent flow in gas turbine combustion chambers. The program can handle reacting or non-reacting, swirling or non-swirling, diffusion or premixed flames, and gaseous or liquid fuel combustion. In the region of interest the program computes: 1) axial, radial, and swirl velocity components, 2) pressure, 3) enthalpy, 4) turbulent kinetic energy and its dissipation rate, 5) mass fractions of total fuel, unburned fuel, oxygen, carbon monoxide, carbon dioxide, and water, 6) radiation flux vectors, and 7) spray trajectory, droplet size distribution, and evaporation rates. In addition, COM3D predicts pollutant emissions of soot and nitrous oxides. COM3D is capable of analyzing a variety of combustor configurations, including can, can-annular, and annular. The use of primitive variables in the model makes modifications to the boundary condition easy, allowing the user to analyze complex inlet geometries.

This program is written in FORTRAN V for batch execution and has been implemented on a CDC CYBER 170 series computer with a central memory requirement of approximately 210K (octal) of 60 bit words. The COM3D program was developed in 1982.

LANGUAGE: FORTRAN V

MACHINE REQUIREMENTS: CDC CYBER 170 Series

PROGRAM SIZE: Approximately 8,650 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI EBCDIC Card Image Format
                      Magnetic Tape

PROGRAM NUMBER: LEW-13930

DOCUMENTATION PRICE: $46.50   PROGRAM PRICE: $1,125.00

COMPUTER SOFTWARE MANAGEMENT AND INFORMATION CENTER

COSMIC
PROGRAM ABSTRACT

MSC-20448

TRASYS II THERMAL RADIATION ANALYSIS SYSTEM
(Martin Marietta/NASA Johnson Space Center)

The Thermal Radiation Analyzer System, TRASYS II, is a computer software system with generalized capability to solve the radiation related aspects of thermal analysis problems. When TRASYS II is used in conjunction with a generalized thermal analysis program such as the Systems Improved Numerical Differencing Analyzer (SINDA) program, any thermal problem that can be expressed in terms of a lumped parameter R-C thermal network can be solved. TRASYS II provides for the calculation of internode radiation interchange data and for the calculation of incident and absorbed heat rate data originating from environmental radiant heat sources. Data of both types is provided by TRASYS II in a format directly usable by such thermal analyzer programs as SINDA.

The TRASYS II system consists of two major components: the preprocessor and the processor library. One primary feature of TRASYS II is that it allows users to write their own executive, or driver, programs which organize and direct the library routines toward solving each specific problem in the most expeditious manner. The preprocessor first reads and converts the user's geometry input data into the form used by the processor library routines. Next, the preprocessor accepts the user's driving logic, written in the TRASYS II modified FORTRAN language, that directs the user-provided and processor library routines in the solution of the problem. The processor library consists of FORTRAN routines that perform the functions commonly needed by the user to solve thermal radiation problems. In many cases, the user has a choice of solution techniques to perform the same function. As previously mentioned, users may provide their own routines where desirable. In particular, the user may write output routines to provide for an interface between TRASYS II and any thermal analyzer program using the R-C network concept.

Input to the TRASYS II program consists of EDIT/CONTROL data and MODEL data. The EDIT/CONTROL data does not participate in the definition of the thermal radiation problem but provides for basic program control and provides the user with an editing capability. The MODEL data provides for the definition of the mathematical model of the thermal radiation problem. The MODEL data includes surface geometry data, documentation data, nodal data, block coordinate system data, form factor data, operations data (the user's driver logic), and user-supplied subroutines. TRASYS II currently allows problems with as many as 1,000 nodes and time variable problem geometry. The edit capability allows for the easy modification of complex thermal radiation problem models. Output from TRASYS II consists of two basic types of data: internode radiation interchange data, and incident and

MSC-20448

absorbed heat rate data. A plot package provides for the plotting
of input geometry, orbit data (for on-station spacecraft problems),
the two types of data described above; and any other data generated
by the user's driver logic.

The TRASYS II system is written in FORTRAN V and Assembler
for batch execution and has been implemented on a UNIVAC 1100
series computer under EXEC8 with a minimum central memory requirement
of approximately 46K of 36 bit words. This latest revision of
the TRASYS system was developed in 1981.

LANGUAGE: FORTRAN V (99%); ASSEMBLER (1%)

MACHINE REQUIREMENTS: UNIVAC 1100 Series

PROGRAM SIZE: Approximately 50,000 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI UNIVAC COPOUT Format
                      Magnetic Tape

PROGRAM NUMBER: MSC-20448

DOCUMENTATION PRICE: $109.50   PROGRAM PRICE: $4,100.00

COSMIC
PROGRAM ABSTRACT

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OF POOR ...

MSC-20590

TRAP – Transient Response Analysis Program
(Rockwell International Corporation)

The Transient Response Analysis Program, TRAP, was developed
to aid in the analysis of the frequency response characteristics
of force transmission and shock damping devices. When an input
load is stepped or suddenly changed in value, the displacement
of the main component, such as a piston or armature, will exhibit
oscillation. The oscillation settles down and the new equilibrium
position or steady state trend is achieved. This behavior can
yield information about the device's damping characteristics.
The TRAP program uses this type of approach to determine damping
characteristics of both installed and separated devices. Examples
of devices that might be analyzed with TRAP include hydraulic
actuators, automotive shock absorbers, and electromechanical
actuators.

The TRAP program is capable of handling a second order,
non-linear dynamic system with a non-constant steady-state response
curve. The system may have variable damping characteristics
with damping as a function of position. Input to TRAP consists
of output force and displacement histories from when the device
was subjected to a stepped load. From this data, TRAP predicts
the force magnification (transfer function) and response phase
angles as functions of input frequency. The TRAP program generates
output for graphical presentation of damping and stiffness
characteristics as well as force magnification and phase angle.

The TRAP program is written in FORTRAN IV for batch execution
and has been implemented on a CDC CYBER 170 series computer with
a central memory requirement of approximately 70K (octal) of 60
bit words. The TRAP program was developed in 1982.

LANGUAGE: FORTRAN IV

MACHINE REQUIREMENTS: CDC CYBER 170 Series

PROGRAM SIZE: Approximately 290 Source Statements

DISTRIBUTION MEDIA: Listing Available Only

PROGRAM NUMBER: MSC-20590

PRICE: $45.00

NOTE: The price includes program documentation and a program
       listing. The documentation is not sold separately from
       the program listing.

COSMIC
PROGRAM ABSTRACT

NPO-16234

CRISP80 - Software Design Analyzer System
(Caltech/JPL)

The CRISP80 Software Design Analyzer System is a set of programs forming a software design and documentation tool which supports top-down, heirarchic, modular, structured design and programming methodologies. The quality of a computer program can often be significantly influenced by the design medium in which the program is developed. The medium must foster the expression of the programmer's ideas easily and quickly, and it must permit flexible and facile alterations, additions, and deletions to these ideas as the design evolves. The CRISP80 software design analyzer system was developed by Dr. Robert Tausworthe to provide the programmer with just such a design medium. CRISP80 allows for the expression of the design as graphic as a "picture of the program" and yet not be the program and not be constrained by the syntax of a computer language.

A program design using the CRISP80 design analyzer consists of short, English textual descriptions of data, interfaces, and procedures that are imbedded in a simple, structured, modular syntax. Output from CRISP80 displays the program design as a set of modules heirarchically refined into algorithms, data structures, and interfaces. The display is formatted into two-dimensional flowchart-like segments for a graphic presentation of the design. Together with a good interactive full-screen editor or word processor, the CRISP80 design analyzer becomes a powerful tool for the serious programmer. In addition to being a text formatter, the CRISP80 system prepares material that would be tedious and error prone to extract manually, such as a table of contents, module directory, structure (tier) chart, cross-references, and a statistics report on the characteristics of the design.

The CRISP80 software design analyzer system is written in Microsoft BASIC-80 for interactive execution. The system has been implemented on a Z80-based microcomputer operating under CP/M with a memory requirement of approximately 39K of 8 bit bytes for the largest program. The CRISP80 program was developed in 1983.

LANGUAGE: BASIC

MACHINE REQUIREMENTS: Z80-Based Processor with CP/M

PROGRAM SIZE: Approximately 2,300 Source Statements

DISTRIBUTION MEDIA: 8 Inch Single-Density CP/M Format Diskette

PROGRAM NUMBER: NPO-16234

DOCUMENTATION PRICE: $24.00   PROGRAM PRICE: $370.00

COMPUTER SOFTWARE MANAGEMENT AND INFORMATION CENTER

4. MARKETING

The marketing activities performed by COSMIC involve: solicitation of gratis advertisement of computer programs available from COSMIC in the technical press and trade journals; attendance at trade shows and professional society meetings to promote the services and software available from COSMIC; utilization of various media for the general promotion of COSMIC; utilization of benefits analysis reports to highlight COSMIC's technology transfer function; and preparation of abstract collections and program summaries.

A continuing marketing activity emphasized by COSMIC is the solicitation of gratis announcements of selected COSMIC programs in trade and technical publications. In March announcements about COSMIC products were published in:

HARDCOPY	1983 Catalog
Newsletter of Engineering	
Analysis Software	GSC-12669 SEL/DBAM and 1983 Catalog
CP/M Review	General Information
Miami Herald	General Information
Indianapolis Star	General Information
C2MUG Newsletter	General Information

A news release about SDDL (NPO-16201 and NPO-16202) was sent to:

Computerworld
ICP Interface
Datamation
Systems & Software
Computers-R-Digital
ICP Software Business Review
DEC Professional
Mini-Micro Systems
Hardcopy
Software News
Computer Decisions
Decuscope

COSMIC exhibited at the Design Engineering Show in Chicago, on March 28 through March 31. The new COSMIC display was used and specially prepared brochures covering CAD/CAM software and NASTRAN were distributed at the show.

Attendees included a wide range of engineers and draftsmen from many industries. Over two hundred attendees requested further information be sent to them concerning COSMIC's products and services.

From the February 7th article in computerworld announcing the availability of the VAX Security Package (MSC-20423), COSMIC has received over sixty requests for additional information concerning this program. Also, eight program sales and fifteen document sales can be directly attributed to this article.

The general information article which appeared in the Miami Herald and the Indianapolis Star is a syndicated column entitled "The Business Computer". Approximately thirty newspapers throughout the country carry this column.

5. CUSTOMER SERVICE

Customer Service provided by COSMIC, in addition to the distribution of program code and documentation, includes responding to requests for information. These requests may be in the form of telephone calls, letters, TECH BRIEF cards, mini-brochure cards, or trade show return cards. Generally the requested information concerns the services provided by COSMIC, or information on specific programs or groups of programs which may be available from COSMIC. During March, a total of 640 information requests were processed. This was divided into 606 domestic requests and 34 international requests.

One other area of Customer Service is the response to requests for information relevant to problems associated with a particular program product installation. These requests are usually handled jointly with the Technical Service Staff. After the customer problems have been resolved, a Problem Report Sheet is processed and added to the program package file for future reference. Eight problem reports were processed this month.

During the month of March, a total of 241 customers representing 212 organizations received materials (programs, documentation, or catalogs) from COSMIC. Customers represent individuals, whereas, organizations represent corporations or institutions. These customers are located in 40 different states or territories. Both NASA and non-NASA disseminations are reflected in these statistics.

The following map graphically illustrates the COSMIC first quarter sales by state. It represents only the continental U.S. domestic sales for the period of January 1, 1983 through March 31, 1983. Dollar amounts for each state are the sum of all program, document, and catalog sales, plus all leases (both initial and renewal).

COSMIC SALES BY STATE

1983 FIRST QUARTER SALES
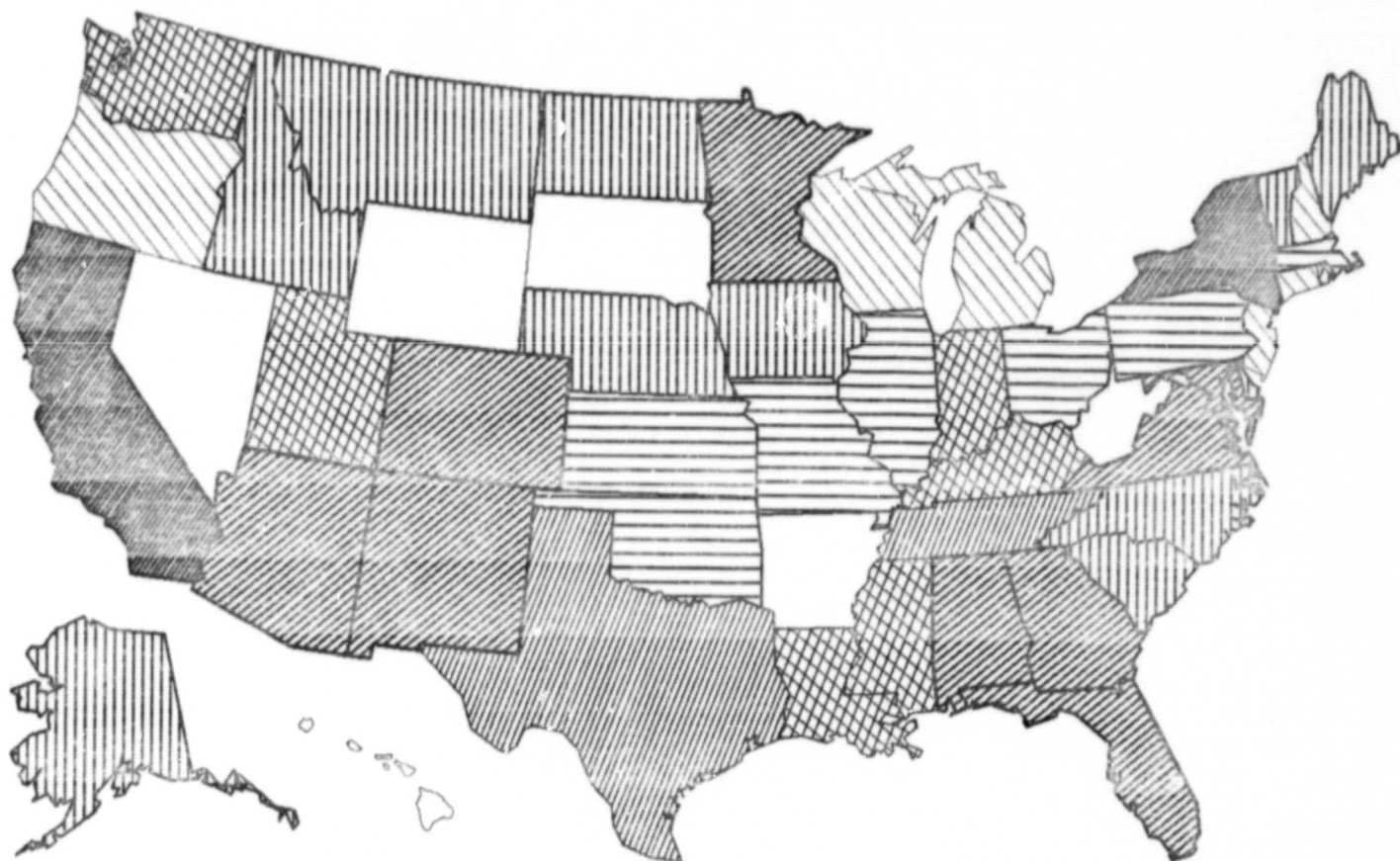
LEGEND: SALES

NO SALES	$1-100
$101-500	$501-2,000
$2,001-5,000	$5,001-10,000
$10,001-20,000	OVER $20,000

6. BENEFITS IDENTIFICATION

COSMIC follows an active campaign of interviewing previous customers in order to ascertain the utility of distributed programs and identify specific benefits accruing to users of these programs. Additionally, contact with customers is used to evaluate the services provided by COSMIC. When notable benefits are identified, they are documented in reports written by COSMIC staff which are then approved for public release by the customers. Two benefits reports are in the process of being authorized for release. No benefits reports were released for publication this month.

7. MAINTENANCE AND SUPPORT

Sperry completed the SYSGEN and testing of the April 1983 release of NASTRAN on the CDC version at Langley Research Center. The SYSGEN of the IBM and UNIVAC versions is complete. The testing of these versions and the SYSGEN of the DEC VAX version is continuing. A total of sixty-eight (68) SPR's have been incorporated into this release of NASTRAN. Sperry has also incorporated the following new capabilities into NASTRAN:

- BANDIT
- NSRDC Stress Averaging Capability
- MSFC Hydroelastic Capability
- Converting the UNIVAC to ASCII
- Hidden Line Capability
- Elbow Element

This release of NASTRAN is scheduled for completion during April 1983. Copies of this release will be shipped to all current lessees during the month of May.

All of the pre-colloquium activities for the Eleventh NASTRAN User's Colloquium in San Francisco are on schedule. The final agenda for the colloquium and associated workshops was prepared and will be mailed to all the attendees of the colloquium.

During the month, assistance was given to several lessees on problems encountered with NASTRAN.

TABLE 4 TOTAL DISSEMINATIONS

ITEM	Current Month		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
A. ITEMS INVOICED				
1. Programs	38	$41,235.00	118	$110,085.00
2. Documentation	175	6,940.50	415	16,431.50
3. Leases (Initial)	6	19,900.00	15	53,590.00
4. Leases (Renewals)	2	7,560.00	12	48,720.00
5. Leases (Misc.)	3	834.00	7	1,901.14
6. Catalogs	143	3,325.00	524	11,190.00
7. Miscellaneous	26	863.10	54	2,171.84
TOTAL INVOICED		$80,658.04		$244,809.48
B. NASA (No Charge)				
1. Programs	6	$ 4,615.00	14	$ 12,995.00
2. Documentation	16	989.00	36	1,951.50
3. Leases (Initial)	–	–	1	1,800.00
4. Leases (Renewals)	1	2,700.00	12	41,340.00
5. Leases (Misc.)	–	–	–	–
6. Catalogs	4	40.00	25	330.00
7. Miscellaneous	–	–	1	100.00
TOTAL NASA		$ 8,344.00		$ 58,516.50
C. OTHER (No Charge)				
1. Catalogs	2	$ 60.00	14	$ 270.00
2. Replacements	1	1,145.00	1	1,145.00
3. Miscellaneous	–	–	–	–
TOTAL OTHER		$ 1,205.00		$ 1,415.00
GRAND TOTAL DISSEMINATION		$90,207.04		$304,740.98

TABLE 5 NASTRAN DISSEMINATIONS

Item	Current Month VOLUME	Current Month VALUE	Year to Date VOLUME	Year to Date VALUE
A. ITEMS INVOICED				
1. Leases Initial	1	$ 5,600.00	5	$21,840.00
2. Leases Renewals	2	7,560.00	12	48,720.00
3. Leases Misc.	2	793.03	2	793.03
4. Documentation	16	775.00	66	3,385.00
5. Miscellaneous	(1)	(66.45)	3	161.20
TOTAL NASTRAN INVOICED		$14,661.58		$74,899.23
B. NASA (No charge)				
1. Leases Initial	–	–	–	–
2. Leases Renewals	–	–	11	$38,640.00
3. Leases Misc.	–	–	–	–
4. Documentation	10	$ 810.00	14	890.00
5. Miscellaneous	–	–	–	–
TOTAL NASA NASTRAN		$ 810.00		$ 39,530.00
GRAND TOTAL NASTRAN		$15,471.58		$114,429.23

TABLE __6__ DISSEMINATION OF DOD SUBMITTALS

Item	Current		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
1. Programs	3	$ 2,515.00	9	$ 6,325.00
2. Documentation	5	123.50	16	352.00
TOTAL DISSEM. DOD SUBMITTALS		$ 2,638.50		$ 6,677.00

TABLE __7__ FOREIGN DISSEMINATIONS

Item	Current		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
1. Programs	8	$16,500.00	27	$44,300.00
2. Documentation	23	2,216.00	56	4,480.00
3. Leases Initial	-	-	1	7,000.00
4. Leases Renewal	-	-	-	-
5. Leases Misc.	-	-	1	35.70
6. Catalogs	24	975.00	70	3,250.00
7. Miscellaneous	13	631.38	29	1,092.72
TOTAL FOREIGN DISSEM.		$20,322.38		$60,158.42

9. BUDGET SUMMARY

CONTRACT NASW-3247

March, 1983

	ESTIMATED EXPENDITURES		ACTUAL EXPENDITURES	
	Current Mo.	Cumulative	Current Mo.	Cumulative
PERSONNEL	20,673.00	62,019.00	21,466.50	63,676.55
OVERHEAD	19,584.00	58,752.00	12,365.38	37,034.71
STAFF BENEFITS	4,942.00	14,826.00	5,333.75	15,436.11
TRAVEL	1,719.00	5,157.00	1,709.43	2,762.56
EQUIPMENT PURCHASE	400.00	1,200.00	4,433.41	4,613.36
EQUIPMENT RENTAL				
Computer Usage	8,000.00	24,000.00	4,488.01	13,863.40
Misc. Equipment	1,853.00	5,559.00	161.54	2,394.90
MATERIALS & SUPPLIES	6,421.00	19,263.00	7,708.97	27,164.35
COMMUNICATIONS	1,206.00	3,618.00	1,460.39	4,207.76
OTHER				
Duplicating Expenses	-0-	-0-	-0-	-0-
Promotional Expenses	688.00	2,064.00	4,128.75	7,557.98
Microfiche Expenses	599.00	1,797.00	-0-	1,133.05
TOTALS	66,085.00	198,255.00	63,256.13	179,844.73
MAINTENANCE & SUPPORT EXPENSE	27,448.00	82,344.00	29,425.10	95,343.24
GRAND TOTALS	93,533.00	280,599.00	92,681.23	275,187.97

	ESTIMATED		ACTUAL	
	Current Mo.	Cumulative	Current Mo.	Cumulative
INCOME	65,145.00	195,435.00	85,337.48	292,981.29